

COST *and* MANAGEMENT

THE OFFICIAL JOURNAL

OF THE

CANADIAN SOCIETY OF COST ACCOUNTANTS

INCORPORATED 1920

HEADQUARTERS, 81 VICTORIA ST., TORONTO

Telephone Elgin 8914

Vol. 4

SEPTEMBER, 1929

No. 9

CONTENTS

	Page
RECENT DEVELOPMENTS IN CURRENCY AND CREDIT.	
<i>Arch. B. Clark, M.A., F.S.S.</i>	2
THE COST ACCOUNTANT,—OR ONLY NINE MONTHS BEHIND. <i>G. E. F. Smith, C.A.</i>	12
ADVANCED COMMERCIAL COURSES IN MONTREAL	21
PERSONAL ITEMS	21
INSTALLATION AND CONTROL OF A MODERN PLANT LEDGER. <i>J. P. Masterson</i>	22
THE TREND OF PRODUCTION COSTS	31
NEW "CENTRAL ONTARIO" CHAPTER IS FORMED	32

Extra copies of this journal may be obtained at 50c each to members
and \$1 each to non-members.

Recent Developments in Currency and Credit

By ARCH. B. CLARK M.A., F.S.S.,
Professor of Political Economy, University of Manitoba

(Before Winnipeg Chapter, March 19th, 1929)

AMONG the most interesting of the problems that have had to be dealt with during the years which have elapsed since the close of the war has been the restoration to a healthy condition, or in some cases the entire reconstruction, of the badly wounded, or completely destroyed currency and credit systems of the nations involved.

Many of you will remember how the governments of the nations at war flouted the teachings of generations of economists, from Adam Smith and Ricardo downwards, on the evils associated with a depreciated inconvertible currency. One after another these governments entered on the primrose path and indulged in an orgy of excessive issues of inconvertible paper.

In the case of all the leading countries, save Japan and the United States (which latter, as everyone knows, profited greatly from the war), their currencies ceased to be convertible on demand into gold, or to be linked with gold by the maintenance of an exchange standard. The regime of inconvertible or fiat money had begun, and the dangers inherent in this form of currency soon became apparent. Inconvertible paper is pre-eminently a managed currency, and history shows conclusively that it is generally mismanaged. The tendency to over-issue, with consequent depreciation, or fall in the value of the notes, seems to be irresistible. Nor is the fall in their value steady and calculable. The notes, while on balance in general depreciating, fluctuate in value with every change, or rumour of change, in the currency or financial policy of the government of the day.

With the adoption of such a currency, too, the country loses the advantage of the automatic regulation of its money supply through the normal movements of trade, which it enjoys with a gold standard. When the currency is based on gold there is this advantage; for, if prices are too high relatively to the level prevailing elsewhere, then an excess of imports attracted by the high prices, leads to an outflow of gold, credit contracts and prices fall; while, if prices at home are too low, an excess of exports leads to an inflow of gold, with a consequent increase in banking reserves, and a tendency towards expansion of credit and rising prices.

But with an inconvertible paper currency there is no such automatic regulation. The notes remain within the country that issues them, and their value is determined entirely by the quantity in circulation and rapidity or velocity of circulation, relatively to the work to be done by them, or in other words, by the supply relatively to the demand. The only means by which their depreciation can be prevented is a strict limitation of issue whenever the market price of

RECENT DEVELOPMENTS IN CURRENCY AND CREDIT

gold shows the slightest sign of rising above the mint price. But this strict limitation is rarely found in practice, for it presupposes a strong and thrifty government—one with which the interest of the future counts for more than the ease and popularity of the present.

Depreciation and Uncertainty

Few governments, in time of stress, can resist the temptation to meet their immediate financial needs by increased issues of paper, and in this they have invariably the support of the debtor class, claiming that "money is scarce." Hence the tendency is almost always towards excessive issue, with consequent depreciation. From this follows the robbery of creditors to the immediate advantage of their debtors, among whom stands conspicuously the government itself. Then there is also the destruction of all certainty as to the meaning of contracts made in terms of money, and commerce becomes gambling.

These evils were abundantly illustrated in the experience of European countries in the decade which followed 1914. The Russian *rouble*, the Austrian *krone*, and the German *mark* were in turn rendered worthless through excessive issues, involving in their downfall not only a virtual repudiation of national debts but a radical redistribution of wealth, through the disappearance of the accumulated savings of the formerly wealthy classes of those countries. The Italian *lira* and the French *franc* went a long way in the same direction before being stabilized.

If the depreciation of the British pound sterling and the Canadian dollar was in each case kept within comparatively moderate limits, and is now a thing of the past, it is because the financial problems confronting the British and Canadian governments, though serious enough, were less extreme, and a less reckless policy was adopted. But even in Great Britain and Canada the risks associated with an inevitable paper currency were for years sufficiently obvious.

Unable to raise the money required to carry on war by the only sound financial methods—taxation and borrowing the savings of the people—the governments, in the case of both countries, sought to make good the deficiency by borrowing from the banks. Not only were the banks invited to subscribe to war loans, but they were encouraged to make advances to customers to enable them to subscribe to war loans.

Now there is a vital difference here. The transfer of the savings of the people to Government, whether by taxation or borrowing, means no increase in purchasing power, and thus in demand for commodities and services. The reduction in the bank deposits of the individual taxpayers or bondholders is ultimately balanced by the increase in the deposits of the government employees, or of contractors with whom it deals. The amount of bank deposits is the same as before.

But it is far otherwise when the Government, by the issue of an inexpensive legal tender currency, provides the basis for an indefinite expansion of credit. For in that case the increase in the purchasing power of Government, and ultimately of those whom it employs or with whom it deals, is not balanced by any decrease in the demand for commodities or services by other individuals. The increased supply of "money" is gradually diffused throughout the community, and general prices rise.

COST AND MANAGEMENT

But this rise in prices through inflation of credit means an increased demand for the legal tender money. For, as prices rise wages rise with them, even if the rise lags behind that of prices, as it generally does. And more legal tender is needed also to maintain the higher level of prices in retail trade. The result is a general demand for more "cash." Thus the inflation of credit brings in its train an inevitable inflation of the inconvertible legal tender paper. The currency inflation, or anticipation of such inflation, first provides the basis for credit inflation, which in turn necessitates further issues of currency, and thus the mischief circulates.

The Return to Gold

But a currency inflation, brought about by a flood of inconvertible paper, like every other form of debauchery, has its inevitable "morning after," and that came when it was found necessary to retreat precipitately from the bog of inconvertibility to the solid ground of the gold standard. The preparation for this, involving a gradual deflation of the currency, began in England in 1920, and was carried forward at first rapidly and then more slowly till the level of prices had been so far lowered that it was possible to resume in 1925 convertibility of the paper into gold on demand. It should be noted, however, that Great Britain did not return to her pre-war system of using gold coin as an important part of the internal currency. She adopted the plan, "For an economical and secure currency," which had been advocated by David Ricardo more than a century before. By the Gold Standard Act of 1925 the Bank of England is required only to sell gold bullion in bars of 400 ounces troy of fine gold in exchange for legal tender notes at the rate of £3-17-10½ per ounce of standard gold. Thus the gold is available only for export or use in the arts.

But gold itself is admittedly not a perfectly stable standard of value. Since the causes affecting the demand for and supply of any article are ever changing, it is clear that we cannot get absolute stability of value in any commodity. But a commodity like gold has the advantage of being comparatively stable in value. For the demand for it, as currency and for use in the arts, is fairly constant; and the supply, too, owing to the great durability of gold, is less subject to fluctuation than in the case of most commodities, of which the annual supply forms the greater part of the total supply (e.g., wheat).

It is clear, therefore, that changes in the annual supply of gold from the mines will only slowly affect the total supply, and through that the value of gold. Still, over a period of years the cumulative effect of increase or decrease in the annual supply may be considerable. This, then, is one reason why the steadiness in the value of gold is only comparative. Another reason is to be found in changes in demand, arising in part from changes in the currency regulations of various governments.

Gold, then, is not a perfectly satisfactory standard for deferred payments.

The measurement of value is unique in this respect, that there is no concrete, definite and invariable unit of value. The monetary standard of value (with us the gold dollar) differs from other standard units of measurement, such as the yard, in this: that, while the standard

RECENT DEVELOPMENTS IN CURRENCY AND CREDIT

yard is defined by law as a certain definite invariable length, the standard dollar is defined, not as a definite value, but as a definite weight of gold of a certain fineness (in Canada and the United States 25.8 grains Troy of gold 9/10ths fine). And the value of this monetary unit may and does vary over a term of years. It is this variation in the value of the monetary unit that is the root cause of many difficulties and much recent discussion. For changes in the value of money, or general level of prices, do very materially affect the distribution of wealth amongst different classes.

Effects of Price Changes

This is not likely to be questioned by a generation that has experienced the effects of the great inflation of prices during the war and the immediate post war boom, and of the rapid deflation which followed the culmination of that boom in 1920. Taking wholesale prices, it required in 1920 \$2.43½ to buy as much as \$1 could buy in 1913. Prices, as we know, have fallen considerably since 1920, but even yet it requires about \$1.47 to buy as much of the good things of life as \$1 could command in 1913. And, even before the influence of inconvertible paper had been felt, there was a considerable fall in the value of gold, or rise in prices, between 1896 and 1913.

Now the position, as regards the influence of such monetary fluctuations on the distribution of wealth, may be stated in general terms thus: All whose money incomes are fixed, and whose expenditure varies with prices, gain from a fall and suffer from a rise in prices. Such are professional men with fixed salaries, civil servants, landlords with rents fixed under long leases, bondholders, etc. Conversely, all whose money incomes vary with prices, suffer from a fall and gain by a rise in prices—in so far as their money outlay is fixed. Such are merchants, or farmers renting land under long leases. In short, a rise in prices benefits the debtor class at the expense of the creditor, while a fall in prices means an increase in the burden of all debts, national and other.

Amongst the historical tragedies consequent on rising prices was the fate of King Charles I. As the result of the influx of precious metals from America during the century which followed the discovery of the mines of Potosi in 1546 prices in England rose enormously. This increased the expenditure of the Court, while the revenues of the Crown were largely fixed by custom and lacked elasticity. Charles tried to supplement them by arbitrary taxation, and there ensued the eventful struggle between King and Parliament which ended in the execution of the King. Thus do economic forces mould history.

At present, however, several leading authorities are responsible for the opinion that we are entering on a period of growing scarcity of gold and falling prices. If that forecast were fulfilled, it would mean an increase in the burden of our national debt, and in particular a very heavy increase in the burden on the debtor states of Europe. It would seriously increase the value of the annual money payment which Great Britain must continue for more than half a century to make to the United States, but it would also increase the value of the interest Great Britain annually receives from abroad, and on the whole Great Britain would gain, for she is still on balance a great

COST AND MANAGEMENT

creditor country. The net balance of interest on her overseas investments is estimated for 1928 at £285,000,000.

It is clear, therefore, that changes in the value of money are not to be ignored in respect of their effects on the distribution of wealth, whether between industrial classes or between nations.

Effects on Production

Further, in thus modifying the distribution of wealth, changes in the value of money may exert, during the process of change, a very real influence on the production of wealth. It is for this reason that many writers have favoured rising rather than falling prices. Thanks to the marvellous efficiency of the banking system, production tends to be carried on more and more with borrowed capital. It follows that for business men dealing with borrowed capital—the men who “discount their bills”—a long continued fall in prices may mean a serious increase in the real burden of indebtedness. On the other hand, a gentle rise in prices may, while lightening the burden of debt, raise the hopes, kindle the imagination and stimulate the energies of these “captains of industry” to the production of wealth.

Such is the theoretical argument in favour of rising prices; and it is held to have solid support in the history of the past. Thus David Hume in his “Essay on Money,” says of the effect of the 16th century silver discoveries in America—the mines of Potosi (1546): “It is certain that since the discovery of the mines in America, industry has increased in all the nations of Europe, except in the possessors of those mines; and this may be justly ascribed, amongst other reasons, to the increase in gold and silver. Accordingly we find that in every kingdom into which money begins to flow in greater abundance than formerly, everything takes a new face: labour and industry gain life; the merchant becomes more enterprising, the manufacturer more diligent and skilful, and even the farmer follows his plough with greater alacrity and attention.”

Similarly, it is claimed that the great gold discoveries in California and Australia about 1850 materially helped to bring about the expansion of trade and industry which characterized the next twenty-five years. Of their effect, Newmarch, the great statistician and author of the standard “History of Prices, says in 1853: “We are justified in describing the effects of the new gold as almost wholly beneficial. . . . It has already elevated the condition of the working and poorer classes; it has quickened and extended trade, and excited an influence which, thus far, is beneficial wherever it has been felt.”

Ten years later, Stanley Jevons described the effect of the fall in the value of gold as powerfully beneficial: “It loosens the country as nothing else could from its old bonds of debt and habit. It throws increasing rewards before all who are making and acquiring wealth, somewhat at the expense of those who are enjoying acquired wealth. It excites the active and skilful classes to new exertions, and is, to some extent, like a discharge from his debts is to the bankrupt long struggling against his burdens. All this is effected without a breach of national good faith, which nothing could compensate.” In this last sentence, Jevons, it will be observed, clearly differentiates between a rise in prices produced by a natural increase in the money supply,

RECENT DEVELOPMENTS IN CURRENCY AND CREDIT

arising from discoveries, and a rise in prices artificially brought about by excessive issues of inconvertible paper. The effects of such a currency are, as we have seen, almost wholly bad, since it destroys that sense of security which is the basis of credit and of industry.

Falling Prices

If rising prices due to natural causes are thus beneficial, falling prices due to increasing scarcity of gold may be expected to prove harmful to industry. Thus Professor Gustav Cassel, an eminent Swedish authority, holds that falling prices tend to check industrial enterprise; and Mr. Hawtrey in his "Monetary Reconstruction" says: "The relation of business depression to falling prices is so well recognized, not merely among economists but among practical men, that it is hardly necessary to labour the point. Experience has confirmed theory scores of times." Sir Robert Giffen, the eminent British statistician, held that both excess and defect of the gold supply were hurtful, but that, on the whole, a moderate excess, giving a moderate rise in prices, was to be preferred.

On the other hand, there have not been wanting exponents of the opposite view: that falling prices are the more desirable. Thus the late Dr. Alfred Marshall, of Cambridge, admittedly the greatest economist of recent times, maintained that, on the whole, falling prices are better for society than rising prices. "It wants," he says, "very much stronger evidence—statistical evidence—than one yet has, to prove that a fall of prices diminishes the productiveness of industry, *except during a relatively short transitional period.*" This exception, however, seems to me rather important. It is, of course, clear that whether the general level of prices is high or low is a matter of indifference once that level is established. It simply means exchanging wealth with a greater or smaller number of counters. Any effect on the distribution, and, through that, on the production of wealth, is possible only during the period of transition from one level of prices to another. But, as recent experience shows, that "relatively short transitional period" may be sufficiently long to admit of very serious effects both on the distribution and on the motives to production. Bearing this in mind, we may accept Marshall's position. His ideal currency system was one in which "prices should fall at such a rate that receivers of fixed salaries should secure a fair proportion of man's increasing control over his material environment."

This also is the position take by Mr. W. T. Layton, editor of the London "Economist." The period 1873-1896 was one of falling prices which undoubtedly had a substantial influence on the distribution of wealth. But Mr. Layton points out that "the arts of production and the means of transport probably progressed faster between 1874 and 1896 than they had ever done before;" and he concludes that there is no reason to desire an advance in prices on the ground that it stimulates production, and that "on the whole the social wellbeing is best advanced when prices are stationary or slightly declining."

It is true, as we have already seen, that falling prices, i.e., a rising value of the gold dollar, means an increase in the weight of all debt charges. But, as against this, it also tends, while the movement

COST AND MANAGEMENT

continues, to increase the demand for interest-bearing securities, which rise in price, thus facilitating the conversion of the debt to a lower rate of interest. In 1896, when general prices were at their lowest point for the 19th century, British consols were at their highest—144.

Discussions on Gold Standard

The return to the gold standard, involving as it did a policy of deflation, was strenuously opposed by certain business interests, and was severely criticised by a small number of economists, of whom J. M. Keynes was the most prominent, on the ground that the difficulty of readjusting contracts to the rising value of money (or lower price level) meant inevitably depression of trade, irregular employment, strikes or threats of strikes against falling wages and unemployment.

Now it is beyond question that, just as a country's export industries are stimulated during the process of depreciation of its currency relatively to gold or to the currency of other countries, so they suffer during the process of relative appreciation of the currency; while the converse is true of industries dependent on imports, i.e., they suffer from depreciation and gain from appreciation of the currency relatively to gold.

But this currency influence on trade and industry, serious though it may be for a time, exists only during the interval which elapses before the general level of prices and wages at home, or the internal value of the currency, has been adjusted to the change in its external value in terms of gold or of other currencies. The temporary suffering in the export industries during the process of currency appreciation is the inevitable price that has to be paid for the preceding debauch of depreciation. With the return of the gold standard comes comparative stability in the value of the currency in terms of the currencies of other gold-standard countries, fluctuations in the foreign exchanges being confined within the limits set by the gold points.

But Mr. Keynes and his school are primarily concerned not with the foreign exchanges, but with the level of prices at home. They maintain that even in ordinary times, with the gold standard in operation, the recurrence of crises, labour disputes and unemployment, are in great measure due to the instability in the internal value of money, i.e., the level of prices at home. They would, therefore, substitute a managed currency, regulated by reference to index numbers of prices or unemployment, for a currency based on gold. On this view, stability of the level of prices, or internal purchasing power of money, rather than stability of the foreign exchanges, should be the goal. And to its attainment the one essential condition is control of the creation of credit.

Now this doctrine is clearly in direct opposition to the generally accepted theory, according to which the volume of credit and the level of prices are most effectually controlled by the limitation of currency involved in the maintenance of the gold standard, with a free market for gold. This, it should be noted, was the theory expounded by the old masters, David Ricardo and John Stuart Mill, and it is that of the great majority of economists of yesterday and to-day, including such acknowledged authorities on monetary science as the late Pro-

RECENT DEVELOPMENTS IN CURRENCY AND CREDIT

fessor Shield Nicholson and Edwin Cannan, as well as of practical bankers like Sir Charles Addis and the late Walter Leaf.

The Right Hon. Reginald McKenna, formerly Chancellor of the Exchequer, and now chairman of the world's largest bank—the Midland Bank—has, however, called attention to a recent development, important in theory and more especially in its practical aspects. He points out that, while convertibility into gold has been restored in the case of the £1 sterling, and the most important European currencies are now stabilized in value in terms of gold, yet the position of gold in the currency and credit system is not what it was in pre-war times. In these days the Central Banks allowed the expansion and contraction of credit, and thus the internal supply of money to be almost automatically regulated by the increase or decrease of their gold reserves, as determined by the movement of gold into or out of the country. If the inflow of gold was abundant the resulting increase in the bank reserve led to a fall in the rate of discount, expansion of credit and currency, and, *ceteris paribus*, rising prices. If, on the other hand, a foreign drain of gold threatened seriously to affect the reserve, the rate of discount was raised, credit and currency contracted, the growth of business was checked and prices fell. Thus the course of world prices was dependent on the supply of gold, the movements of which were speedily recorded by the bank rate in London.

Great Britain was then the world's creditor, and London without a rival as the monetary clearing house and free gold market of the world; and the Bill on London was "the real cash of international commerce." In London was the world's financial pulse. It was there that the abundance or scarcity of gold first made its influence felt on the rate of discount, the state of credit and the level of prices; and it was through the British price level that gold influenced the price levels of all other countries.

Further, owing to the hierarchical nature of the British banking system, in which the English country banks, as well as the Scottish and Irish banks, kept their reserves with the big London joint stock banks, and these in turn kept theirs with the Bank of England, which again used the greater part of these bankers' balances in lending to its customers—owing to that system, the ultimate gold reserve in the banking department of the Bank of England—the basis of the whole banking and credit system—was very small indeed compared with the immense superstructure of credit it supported. Hence, to adopt Sir Robert Giffen's simile, like a small weight on the long arm of a lever a slight change in the amount of that gold reserve had a tremendous influence in expanding or contracting credit and thus in raising or lowering the level of British prices, and, through that, the price levels in other countries.

The British banking system, as Walter Bagehot wrote in his well known work, "Lombard Street," was before the war "the greatest combination of economical power and economical delicacy that the world has ever seen." The delicacy is still there, but something of its former power has in recent years been lacking.

Under this system the influence of the gold supply on credit and prices was allowed full play. The chief care of the central bank was simply to protect its reserve by adjusting the rate of discount to meet

COST AND MANAGEMENT

the exigencies of the situation from time to time. There was no attempt to sterilise gold in respect of its influence on credit and prices.

Influence of United States

But the position has been radically altered in consequence of the war, and the enormous financial sacrifices it entailed for Great Britain. While London is still pre-eminently the world's clearing house, and is once more, since 1925, a free market for gold, Great Britain no longer holds the unique position she formerly occupied as the world's creditor. America now possesses not much less than half the world's stock of monetary gold, and the fact that she is now an international lender, and creditor, for huge sums, of the leading European nations, strengthens her position in that respect. Thus she can afford to part with large sums in gold without endangering her banking reserve; and, on the other hand, her central banking system (i.e., the Federal Reserve System) enables her to absorb immense sums in gold and yet sterilise it, that is, deprive it of the power to create credit.

This the Federal Reserve System does by its open-market operations. According to the Board's interpretation of trade requirements for currency and credit, the Reserve Banks buy or sell government or other securities. If it is considered that more cash is needed the Federal Reserve Banks purchase securities or discount eligible paper (i.e., essentially bills of exchange arising out of commercial transactions and maturing within ninety days, save in the case of agricultural paper, which is eligible with a currency up to nine months). This increases the cash at the disposal of the member banks, and so enables them to adopt a more liberal lending policy, thus tending to create a borrower's market. If, on the other hand, it is thought that money is too plentiful, and that there are signs pointing to price inflation, the Reserve Banks sell securities and let their bills mature without restocking their portfolios. This lessens the cash at the disposal of the member banks and causes them to adopt a less liberal lending policy, thus tending to create a lender's market.

Such open-market operations by the Federal Reserve Banks, on the advice of the Federal Reserve Board, not only exercise an independent influence on the credit situation, and through that, on the general price level, but are also a means of preparing the way for changes in the Federal Reserve discount rate and making them effective.

There is nothing new in this last mentioned use of open-market operations by a central bank. It has long been a weapon in use by the Bank of England. If that bank sees the approach of an unfavourable state of the foreign exchanges, and the danger of a foreign drain of gold unduly depleting its reserve, while yet money is abundant in the London money market, and the market rate of discount low, it raises its official minimum rate—the bank rate, and at the same time borrows in the market. This it does by selling consols for cash and buying them back for the account, i.e., for future settlement. This tends to deplete the market of cash for the time, and to pull up the market rate in sympathy with the bank rate, thus making the latter effective in checking the foreign drain and so protecting the bank's reserve of gold.

RECENT DEVELOPMENTS IN CURRENCY AND CREDIT

But in such market operations there was, in pre-war days, no attempt to influence *directly* the state of credit, and, through that, the value of money, or general prices. The ruling consideration was the protection of the gold reserve as the basis of credit.

America, however, supported by her immense holdings of gold, has shown in recent years that central banks have the power, under such favourable conditions, to regulate the supply of money and maintain a fairly steady level of prices independently of gold movements. In such a case, even in a gold standard country, the supply of gold ceases to be the controlling factor in determining the supply of money, and through that, affecting the level of prices. In other words, gold, while still the medium for the payment of international balances, is no longer the ultimate standard of value. The purchasing power of the dollar no longer depends on the value of gold, but is determined by the policy of the Federal Reserve Board.

And just as formerly the price level in Great Britain influenced the price levels throughout the gold-using world, so now the price level in the United States dominates the price levels throughout the world. If outside prices are too high America will get the surplus gold; if they are too low America will supply the gold required to raise them through the normal movements of trade. Thus, according to Mr. McKenna, so long as the present financial supremacy of America continues, and her stock of gold is so large that her Federal Reserve System, regardless of its inflow and outflow, is able to regulate the state of credit and the level of prices, the dollar, not gold, will remain the standard of value throughout the world.

This argument, however, based as it is on the experience of the years preceding the stabilization of the leading European currencies, when the inflow of gold to the United States was overwhelming, appears greatly to overestimate the power of the Federal Reserve System under less abnormal conditions. Dr. W. R. Burgess, the most recent exponent of the system, clearly recognizes that its influence is strictly limited. Speaking on 11th December, 1928, he said: "The loss of half a billion of gold in the past eighteen months brings us nearer to the time when the status of the country's gold reserve cannot be disregarded, and when the Reserve System will of necessity operate more nearly in accordance with the traditional practice of banks of issue under the gold standard."

Even in respect of the total amount of credit available in the country, the action of the Federal Reserve System is not the only factor to be considered; and that it cannot determine the use to be made of that credit is admitted. The enormous growth of brokers' loans in support of the unprecedented speculative boom in the New York stock market within the last two years provides a striking commentary on the practical working of the system. The repeated "warnings" of the Federal Reserve Board have proved but a feeble and ineffectual substitute for a courageous use of the rate of discount.

The Cost Accountant,—or Only Nine Months Behind

By G. E. F. SMITH, C.A.

Richardson, Smith, Ferrie & Co.

(Before Hamilton Chapter, March 13, 1929)

I FIND that I am on the program to speak on two subjects.

(a) The Co-ordination of Statistical Records.

(b) The Control of Waste through Cost Records.

Concerning (a) I know nothing about it, and upon referring to my dictionary, I gather that it probably means—Facts and figures regarding the condition of two or more classes of people (preferably one white and one coloured) forming a system of two or more magnitudes used to define the position of a point line or plane or rod, pole and perch.

This definition leads me to think that it would be quite a simple subject to talk about and with a half-hour's preparation even a Toronto member could get up quite an interesting paper. Quite unworthy of the efforts of your vice-chairman, and I therefore dismiss it.

Concerning (b)—The control of waste through Cost records. This, indeed, is a subject on which I can talk and surely with good knowledge. The fact that few cost accountants will agree with my views is sufficient proof that what I think, say or do on, in or about this important subject is all correct.

Mr. LeBrocq, our worthy Chairman, assured me the other night, over his fourth scotch, when I was just sipping my first, that he knew that I knew a good deal about Cost accounting, but that he wanted me to conceal my knowledge and not to "go over the heads" of the members. "Give 'em," he hiccupped "the stuff they're used to."

Mr. Mouncey, who only looked sober, said that he did not think that I was to speak on the control of waste through cost records, but that he was sure that the selected subject was either the usefulness of cost records or the uselessness of cost accountants. He finally thought that it did not matter much whether I spoke or not so long as I started an argument, to do which he considered I was eminently fitted.

Mr. Chairman, I am aware that it is usual for the speaker at our gatherings to pass upon the intelligence of his audience and so not to depart from this time-honoured custom, it gives me much pleasure to say that I have never before faced such an intelligent looking lot of men.

The questions naturally arise in my mind. Are they really only Cost Accountants? Can their intelligence be only feigned? Are the expressions of deep thought and inward contemplation merely masks hiding chronic indigestion? These men, Mr. Chairman, look like soldiers, clergymen, bottleggers, bankers, biscuit makers, plumbers, lifeguards. Men who go out into the open spaces where men are

THE COST ACCOUNTANT,—OR ONLY NINE MONTHS BEHIND

men—men who make money. And yet they are only Cost Accountants—men who are bent upon saving waste. The occupation of a scavenger!

And now, Mr. Chairman, to my subject. "The Control of Waste through Cost Records." What pictures these words conjure in the mind of a man so experienced as myself!

Enter in thought with me any one of our Canadian factories where a cost system has been installed. We arrive at the cost department. What do we see?

If it is a large factory, we shall see perhaps only fifty cost accountants busily engaged in posting up books, filling in blank forms, operating adding and tabulating machines, etc., etc. A smaller factory will require a greater number of cost accountants and of a more skillful kind. A still smaller—still more men having still more skill.

But why, some one may ask, does a smaller factory require more and more cost accountants having more and more skill? To an experienced cost accountant the answer is obvious. The smaller factory having little or no business must rely almost entirely for its profits on saving waste.

What are these five hundred or four hundred or fifty cost accountants entering in the books and records? What secrets will the punched holes in the cards piled mountains high reveal?

Making Waste Scarce

Figures! Figures! Masses of figures! Figures which if managers could be induced to look at and act upon would make waste so scarce that it would become the rarest of commodities.

Figures which if production engineers and company chemists would take the time to analyze might revolutionize industry.

Here is one cost accountant with columns and columns of figures containing nothing but the cost of elastic used in golf balls. Are his figures made use of? Probably not. Could they be made use of? Certainly yes. Let the engineer, chemist and any average golf player get together, and it is quite certain in my mind that this combined talent, aided by the cost accountant's figures, will produce a golf ball, with less elastic, that will travel in an absolutely straight line, no matter how hit, fifty yards farther.

Here is another cost accountant (not in the same factory, however). His undying hope is to extend the life of an all-day sucker. Each night he goes to bed with the same question on his mind. Why only one day? Why not two days or even two and a half days? Why will the chemist not co-operate? If he could only induce the chemist to even look at his figures. What joy!

There are fifty columns in his book one for each item of cost entering into the composition of a sucker. At the end of each month he charges each item of cost with a certain percentage of Fixed overhead, including the President's salary. The stick which holds the sucker is charged with a double portion.

One month he finds that items 39 to 50 do not pay and suggests to the manager that the suckers should be finished outside. The manager advises him to wait another month. He does this and finds that items 13 to 26 have fallen down badly while there has been quite a revival of form in items 30 to 50. The solution then appears, to

COST AND MANAGEMENT

begin and finish the suckers in the factory, sending them outside for the middle processes.

Extend the life of a sucker! Noble thought! Noble Aim! Not, however, the life of the sucker which the dictionary says is "one of various kinds of fish" (I have never caught any of the other varieties although there may be some). That life is better dead! But the sucker—the joy of little children—made to last twice as long, but just the same size. Same sweetness but improved flavour. Think of it! Family sucker bill cut in half! Mortgage paid off! Father and mother on speaking terms once more!

We may well imagine that these are the thoughts constantly occupying what mind the cost accountant may have.

Will he retain this lofty ambition? Will he be swayed from his purpose in life? Will he lose heart because the manager won't look at his figures and because the President does not know that the company has a cost system and would be very indignant if he found out that part of his salary was being tacked on to the sticks of the suckers?

The cost accountant is not easily discouraged. He may meet with delays, but never gives up. His purpose may be delayed, for example, some day, by the production engineer imparting the startling intelligence that an all day sucker has 60 parts instead of 50, and therefore his cost system is all wrong and "no wonder the company has been losing money."

He must then spend the next two years in convincing the manager that he requires a book with 60 columns instead of 50, or better perhaps, 75 in order to guard against further discoveries on the part of the production engineer.

The New Book

Let us hope that the manager finally consents to the 75-column book, and now we may picture him hard at work. The north end of the book covers his desk while a yard and a half of the south end hangs out of the window. When the time comes to post up the south end he will right about face, or in other words, he will sit on the opposite side of his desk letting the north end of the book take the air.

Here let us leave him—piling up figures—marshalling facts. Facts! Well, facts at least until the production engineer shall reappear with his second discovery that a sucker is not all that it should be or perhaps that it is more than it should be.

Just as the dog is the natural enemy of the cat so is the manager the natural enemy of the cost accountant.

The cost accountant spends hours upon hours trying to show the manager how to get rid of waste. The manager convinces himself in five minutes that the cost accountant is the one item of waste to get rid of.

Managers, as a class, know very little and for this reason, I suppose, few only advance to positions of importance. Hardly one would ever make a desirable cost accountant.

Some managers have made money out of business without cost accountants or cost systems and it has been very hard for the conscientious cost accountant to convince such a manager that it was all wrong to make money without having a proper cost system.

THE COST ACCOUNTANT,—OR ONLY NINE MONTHS BEHIND

"It is better, far better," he will say to the manager, "that you should only earn \$5,000.00 and know that you would have earned \$5,000.00 more if you had not engaged in certain operations; than to have earned \$10,000.00 without knowing that by engaging in those operations you would have only earned \$5,000.00."

While it is true that some managers have made money without cost accountants or cost systems it is equally true that other managers who have cost accountants and cost systems have not lost all they had. Most of the cost accountants working for these managers have been paid in full, showing that without the cost systems the cost accountant could not possibly have received anything. When a cost accountant's salary has been paid in full it is sufficient proof for any unprejudiced person that the cost system is functioning successfully.

Information

The cost accountant knows the kind of information the manager ought to have. The manager only thinks he knows what he wants. There is nothing at all similar about what the manager ought to have and what he wants. The manager likes to have presented to him about 10 o'clock each morning on a half piece (to save waste) of scratch pad paper, such a message as this "Company made \$10,000.00 net profits yesterday." He reads this message carefully and soon understands it. He may then go out and play golf for the rest of the day knowing perfectly well that the business will not suffer thereby.

Let us imagine that such a message had been sent in one morning by the chief accountant, who has a way all his own of figuring profits of which the cost accountant sternly disapproves. No doubt earlier in the morning, the cost accountant had been pleading with the chief accountant to delay the message for nine months. But the chief accountant, not having any too much backbone and being more concerned in pleasing the manager than in doing the right thing, had refused to grant any extension of time.

The cost accountant sadly takes his leave knowing perfectly well in his heart that the chief accountant's figures may be out at least \$200.00 either way, and he is seized with the impulse to overtake the manager in case the latter should be contemplating overnight a drastic change in the policy of the company on the strength of \$10,000.00 profits, which he would never even have considered if he had known that the profits were only \$9,800.00. However, the Company was never in danger, because the only drastic change the manager wanted to make was in his game of golf.

The cost accountant's own figures (and he had many of them) are only nine months behind. Progressive! I should say so. This time last year he was a whole year behind and two years ago he was nowhere at all!

These figures he was carefully carrying to the then escaping manager with whom he had been playing at hide and seek since his installation as chief cost accountant five years ago.

Every day, at frequent intervals, the cost accountant would endeavour to lay before the manager valuable old information but he seldom succeeded because next to playing golf nothing pleased the manager so much as dodging the cost accountant.

COST AND MANAGEMENT

When Manager is "Nailed"

Let us imagine that he has at last succeeded in placing his pile of papers—only nine months old—in front of the manager and that the manager sees little hope for escape. In other words he has the manager "nailed."

The manager picks up sheet No. 1 and blinks at it "What is it all about?" he asks. He hasn't even the intelligence to read the full description printed at the head of each of the 30 or 40 columns which he could easily do with the aid of his field glasses so conveniently hanging on the wall behind him all ready for the races next month.

"This sheet, sir," answers the cost accountant, "contains all the different methods known to the National Society of Cost Accountants together with a few of my own inventions of pro-rating indirect or elusive wages against a given item of cost. The given item of cost on this particular sheet is the benzine used in the manufacture of our Spinster's Own Parisian Shower Bath Soap. Sheet number two deals with the cost of prunes used to give the soap its delicate bouquet. Sheet number three, which we shall probably come to at sunset, is all paris green from whence the soap derives most of its colour, part of its name and all of its purity."

"Never mind getting poetical," says the manager. "Tell me how you figure up all these indirect wages?"

The cost accountant continued—"Column 1 shows the indirect or elusive wages charged according to machine hours; column 2 according to anti-machine hours; column 3 according to the size of the men operating the machines; column 4 according to the floor space occupied by the machines; column 5 according to the vacant spaces; column 6 gives consideration to the attic; column 7 ignores the cellar entirely; column 8—."

"Stop!" cries the manager "you have explained far enough. "Tell me now what use you are going to make out of all those figures?"

"These figures prove or they would prove," said the cost accountant sadly, "if they were not nine months old, that we cannot conscientiously take all the money that the Spinsters of Canada are willing to pay for our soap." "Spinsters are increasing—in numbers I mean,—benzine is cheaper and prunes have a stronger flavor. I have done my best with the indirect wages, having in fact increased these by the amount which properly should be spread over the Married Women's Department. I have even doubled the amount of fixed overhead on one item of cost, having charged the prunes both on the machine hour and anti-machine hour basis."

"I have done my best," he said with tears in his eyes, "to make the cost system show that the Company was not making too much money in the Spinster's Department, and therefore our justification for continuing it."

The Six Months' System

"What we need," he said, cheering up, "is a new up-to-date cost system where we can always be six months behind instead of nine. Ours is now five years old and quite out of style. The up-to-date system requires many more clerks and the books have many more

THE COST ACCOUNTANT,—OR ONLY NINE MONTHS BEHIND

columns. The chief cost men of two continents have discovered new sources of overhead, all of which must be charged to the cost of the raw material. Interest on chattel mortgages, arrears of preference dividends and dividends which some day may be paid on no par common shares, profits which have been left in the business and profits which ought not to have been taken out of the business. All these and many more like them, and unlike them are now by the most advanced school of thought classed as first charges against raw material."

"If you will let me have one of these new up-to-date systems and a few more clerks, after a little practice, with the new kinds of overhead available, I feel sure that without any added expense, six months from now I shall be able to prove to you that six months ago, Spinster's Soap was barely holding its own."

The cost accountant paused. The manager rubbed his eyes and sleepily said, "Anything more?" "Yes, sir, we now come to sheet 2." "Sheet 2!" "Say, do you think I am going through all those papers one by one?" "Not on your life!" "What is this?"

The manager pulled out from the centre of the pile a sheet about 7 feet by 4 feet, which hung over at either end like the ears of a dog. (The rest of the sheets were only about 4 feet square). The sheet was ruled into millions of tiny squares pierced by a most amazing number of lines drawn in all kinds of colours—black, red, green, purple, mauve, salmon, lilac, heliotrope and many others. Some of the lines started from the four corners and a great number began their journeys from the side lines. Most of the lines crossed and re-crossed one another after travelling along a few of the tiny squares, apparently without having any clear ideas as to their respective destinations. A small number seemed to be unable to get anywhere at all, having several times returned to their starting points.

"What in heck is this?" said the manager. "This sir, replied the Cost Accountant, is a graph." "And what in thunder is a graph?" "A graph," said the cost accountant, is "A representation by means of lines exhibiting the nature of the law according to which some phenomena vary." "Speak English or American, can't you," said the manager, "I always thought that a graf was some sort of a foreign big bug." "That kind of a graf," replied the cost accountant, "ends with an 'f', while the one you are looking at ends in 'ph'."

"So far as I can see it has no end at all," said the manager, "What's this lobster supper dream all about."

"This, sir," answered the cost accountant, pointing reverently at the graph, "is a bird's-eye view of your business for the last three years, expired nine months ago. This line—selecting one of the colour of old rose, and which was one of the very few lines that ran in a straight direction—in fact it ran from bottom to top without even hesitating and apparently wanted to go still further only the paper gave out. "This line," he repeated, "indicates the increasing quantities of glucose used during three years in the manufacture of our Pure Stickfast Candy, made exclusively for the Widows' and Orphans' Department, and this other line which runs almost parallel but from top to bottom shows the decreasing cost of sugar used in the same product during the same period. By using more glucose we are able to produce candy that really lives up to it's name and stays stuck."

COST AND MANAGEMENT

By adding a greater percentage of overhead we are able to keep the cost up just as high as when only pure cane sugar was used."

The cost accountant then selected a line running across the paper. The line had had its full share of ups and downs before reaching the other side.

Sales Department Gone Wrong

"This line," he continued, "faithfully portrays the efforts of the Production Department." "Here,"—tracing with his finger one of the sudden rises—"is where we "speeded up" in order to push the finished stocks out of the warehouse and bring them to the notice of the Sales Department, which you will observe by this falling lilac line, was not doing very well. The Sales Department had been relying altogether on a perpetual inventory system to find out if there was anything to sell and forgetting for the time that the books had not been posted for nine months, thought we were all sold out."

"This line" — selecting another — "presents the true history of the progress of our Fluctuating Overhead Department. You will notice that it starts off at the same point as the production line. When things are going well these lines travel side by side across the full length of the paper in perfect harmony, because, as you may not know, the cost of fluctuating overhead increases as production is increased and vice-versa. Here you will see that the production line stopped for 150 squares. It was the time we closed down acting upon the advice of the Sales Department which had again consulted the perpetual inventory."

"It is true that we ought not to have closed down, and the Sales Department made a full confession nine months later."

"The reason why the fluctuating overhead line goes right on after the production line stops is because the production engineer had forgotten to notify the fluctuating overhead manager that his department was not working."

The cost accountant next fixed upon the longest of all the lines which also had had the most varied career. "This line," he continued, "clearly shows the errors of classification made by the Fixed Overhead Department. Fixed overhead does not or should not change as production increases or decreases. If everything had been working properly this line would not have moved at all. In fact it would never have started. A good deal of the trouble was caused by the President, who one month would send out instructions to cut down on the fluctuating overhead, and the only way in which we could carry out his instructions was to transfer a dozen men from the Fluctuating to the Fixed Department. Next month we would be ordered to cut down the fixed expenses and the twelve men would be sent back again. The movements of the lines clearly show the number of times we carried out the President's instructions."

"This purple line," continued the cost accountant "shows the activities of the cost department itself. This sudden rise is where we nearly got inside the nine months' limit and here is where we were driven back.

"Where we cross and re-cross almost immediately this green line, indicates the double mix-up we got into with the General Account-

THE COST ACCOUNTANT,—OR ONLY NINE MONTHS BEHIND

ing Department. Here we clashed with the Chemist's Department and here we just avoided more trouble with the Sales Department."

"Not only," said the cost accountant, "is there a line for each department, but there is also a line for each man working for the Company."

"Say," said the manager, starting up in his chair, "which is mine?"

"One will be allotted you," replied the cost accountant respectfully, "directly you start working."

Let my picture now fade away as I am sure not one of us will care to hear what the manager may have to say.

Graphs for the Illiterate

Upon looking up the history of graphs in relation to cost accounting, I find that they were first introduced at a period when only a few managers could read or write. The early graphs were very simple—a line or two drawn in pencil on a small piece of scrap paper—and a manager followed the program of his business by measuring the lines with his thumb. From this practice came the expression "by rule of thumb." As nearly all managers are now able to both read and write it is at first a little difficult to understand the survival of the graph until we remember that the modern manager had no time for reading.

We must not overlook Robinson Crusoe, who discovered by means of cutting notches in a stick that graphs were possible without paper.

Mr. Chairman, before closing, I would like to express some of my new ideas concerning the installation of cost accountants and cost systems.

It seems to me that as the egg precedes the hen so should the cost accountants and their systems precede business.

Most businesses have been active before the cost accountant has been permitted to come in and for this reason cost systems have had to lag behind. It is greatly to the credit of cost accountants as a whole that they have generally succeeded in catching up to within nine months of the present time.

A Proper Start

I therefore suggest that the cost accountant of the future should first gather around him his assistants, his books, his blank forms, his graphs, his desks, his adding machines, etc.

His next step will be to approach some wealthy friend who ought to go into business. The nature of the business is not important as the thoughtful cost accountant will have already taken care that his books contain a sufficient number of columns to accommodate any kind of business, and that his graphs have been ruled with a few million spare squares.

This friend will be impressed by the cost accountant's sincerity and will immediately hand over the full amount requested, say \$300,000.00.

In the fulness of time the friend will receive in exchange for his money a generous quantity of ex-dividend, no par value, non-voting,

COST AND MANAGEMENT

collapsible stock in the new company which the cost accountant will have formed.

The cost accountant will hold all the voting stock in order that the control may not pass out of his hands; his friend, no doubt, insisting upon this before handing over the money.

Having got the money, the cost accountant, his assistants, his books, his blank forms, his graphs, his furniture, will all drive out together in a fleet car supplied by a real estate agent—or a realtor—to a spot where a well-ventilated, sunny factory site may be secured for a nominal down payment.

The wise cost accountant will choose the summer time, as a few minutes will suffice to select the site, and his assistants may as soon as they get out of the cars commence work right away.

Soon there will be every appearance of a well-conducted extended educational summer camp. The assistants will be more than busy for the tents and supplies will soon arrive and each of the former must be plotted on one or more of the graphs, while the fixed and fluctuating overhead will have to be spread evenly over the supplies.

By and by the walls of the cost Department will grow up and around the cost accountant and his assistants. Now the roof is on. And in a shorter time than could have been anticipated the building is all completed.

The cost accountant and his assistants will have progressed just as fast as the building. The walls, floors, windows and ceilings have all been measured, charted and recorded. The spaces occupied by and between the steel filing cabinets have been scientifically treated. Half the columns in the books are already filled with valuable figures, and, best of all, are right up-to-date.

Never again need the cost Department be behind!

And all this before a wheel has turned! Before a wheel has turned. "Why! that reminds me I have quite forgotten about the factory. It seems to have been left out of the plans and in my enthusiasm over the cost department I must have neglected to tell the architect that a small factory was to be attached to the offices."

Well, after all, does it matter very much. Only \$150,000.00 has been spent so far and if the cost accountant can be persuaded not to take his holidays in South America the remaining \$150,000.00 will keep the Cost Department functioning successfully for some time to come.

The cost accountant has been persuaded to stay at home and his one weak moment having passed away, is determined to rise to heights never yet attained by cost accountants. He will work day and night producing facts and figures, all going to prove that by not building the factory and in forgetting what goods it had been decided upon to manufacture, the loss of many thousands of dollars had been averted and he will be able to truthfully inform his friend that the collapsible shares are no more worthless now than when issued.

The cost accountant collects his assistants around him and after a little community singing, waves them back to their desks. "Coats off!" he cries, "We have only three weeks in which to prove that if we had manufactured anything or engaged in any kind of business

ADVANCED COMMERCIAL COURSES IN MONTREAL

whatsoever we could not have earned even Gross Profits." "Don't spare the graphs!—fill up all the blank forms!" "Get busy!"

In less than three weeks' time the cost accountant has proved what he wanted to prove and starts out with his bundle of proofs for the home of his friend.

Let us hope that they will remain friends as I sincerely hope to remain the friend of each one of you.

ADVANCED COMMERCIAL COURSES IN MONTREAL

MONTREAL Chapter has just issued to its members the official announcement of the "Advanced Commercial Courses" which are to be given at McGill University during the coming winter under the direct supervision of the University and the Montreal Board of Trade, in co-operation with the local Chapters of the Chartered Institute of Secretaries and our own Society.

These courses, the result of much valuable time and consideration of the representatives of the various organizations concerned, evolved from a series of conferences of these representatives, who were formed into a Special Educational Committee for the study of the problem. The Cost Accountants were represented by their genial President, Prof. R. R. Thompson, to whom a large share of credit must be given for the drawing up and promotion of a definite programme for the coming session as outlined in the pamphlet issued.

The lectures, which normally cover a period of three years, include subjects of great value to students seeking to better their qualifications in Cost and Production Accountancy, in Factory Organization and in Industrial Administration. A very able group of lecturers have been secured, and the student fees have been so arranged as to cover only the actual cost of the undertaking based on a maximum enrollment.

Large numbers of young business men ambitious in equipping themselves for better positions will undoubtedly avail themselves of the increased opportunity presented to them. Members of our Society should bring to the attention of their personal and business acquaintances the advantages which are offered to those working for further advancement in industrial and commercial life.

PERSONAL

Thomas Weir, C.A., of Clarkson, Gordon, Dilworth, Guilfoyle and Nash Toronto, has moved to Windsor, where their office is at 802 Metropolitan Bldg.

J. J. Beacham, of the National Cash Register Company of Canada, Ltd., having been promoted from accountant to another position, his place as a junior member of this Society has been taken by W. W. Scott. R. A. MacDougall, factory manager, is senior member from the company.

The Installation and Control of a Modern Plant Ledger

By J. P. MASTERSON,

Cost Accountant, Canadian Industrial Alcohol, Ltd.

(Before Montreal Chapter, March 7, 1929)

SUMMARY

1. Depreciation and its relation to cost.
2. Necessity of including depreciation in costs.
3. Departmentalization necessary for proper distribution of factory depreciation.
4. Classification of property for installation of Plant Ledger.
5. Object and uses of Plant Ledger.
6. Description of Plant Ledger Records.
7. Identification of Equipment.
8. Control of Plant Ledger with General Books.
9. Methods of determining depreciation.
10. Monthly Depreciation Voucher.
11. Repairs and Renewals.
12. Obsolescence.
13. Depreciation Reserve.
14. Hypothetical Life of an Asset.

(1) Depreciation and its Relation to Cost

Cost is defined as the amount or equivalent paid or charged, or given for anything; loss of any kind, expenditure, outlay, as of money, time, labour.

This equivalent may be in the form of money paid for material or for labour, or for some one of the many kinds of expense or loss that exist in every manufacturing business. It is apparent that cost consists of three elements, viz., material, labour and expense, and under the expense classification depreciation should be included as a part of cost. Depreciation attempts to measure the effect of time and production on physical properties and equipment, and to record the result in dollars and cents. This computation cannot be exact, because the elements affecting depreciation are many, and their relative importance difficult to determine.

The use and character of property, its maintenance, the quality of installation, and often local conditions variously modify the life of property, while an unexpected industrial advance may suddenly terminate the usefulness of property, and completely upset depreciation calculations. All plant and equipment suffer from and finally succumb to depreciation. In order that this loss may be reasonably controlled and fully reclaimed in manufacturing costs, it is necessary that you depreciate your plant and equipment on a proper basis, and this can only be accomplished by having a proper accounting system for recording and distributing the depreciation charges.

INSTALLATION AND CONTROL OF MODERN PLANT LEDGER

(2) Necessity of Including Depreciation in Costs

New methods are being introduced and improved machinery installed in the factory every day, with a view of reducing costs either by the elimination of waste, or by increasing efficiency. It is impossible to know whether the introduction of these improvements will reduce costs, unless all elements of costs are included, particularly the allowance for depreciation on the machinery and equipment and the buildings housing the equipment. Any accounting system which does not provide for including depreciation is faulty and one that will not give true costs. The test for depreciation is how long the property will function, or how many units it will produce before scrapping time. Just as the meter notes the flow of current, so depreciation seeks to register in costs the gradual loss of usefulness of plant and equipment. An expanding business outgrows plant and equipment, new improvements send even functioning machinery to the scrap pile.

(3) Departmentalization Necessary for Proper Distributing of Factory Depreciation—Departmentalization of Plant Values

The first step in a fair and equable distribution of factory Depreciation is a departmentalization of the business. Every business can be departmentalized to some extent, some more than others, but the sub-division into departments varies so much in the different lines, that it is almost impossible to give any definite idea as to what division should be made. Generally speaking, it is best to sub-divide into departments according to operation of manufacture, although at times, for simplicity, a sub-division which places similar work in the same department, regardless of operation, is used and has proven satisfactory in a number of cases.

Departmentalizing by operations is a little more complicated, as it results in a greater number of departments, because the same or a similar kind of hand work may be done in several departments, and the same holds true of the machine departments.

In a number of lines of manufacture, all work can be placed in one department when the unit of production is the same; i.e., with hand workers the unit is the productive man hour, with machine workers, the machine hour, and in other departments, the unit may be pound, ton, piece, dozen, square feet, yard, etc. In departmentalizing plant values, the fact should be borne in mind that the better the departmental sub-division is made, the more accurate will be the resultant costs.

(4) Classification of Property for Plant Ledger

A classification of property is a prerequisite to the installation of a plant ledger and the proper recording of depreciation.

The term "Buildings" may include wood, concrete, steel or brick structure, all of which may be subject to different depreciation rates.

The term "Machinery and Equipment" may include electrical generators, steam engines, boilers, pumps, motors, lathes, planes, presses, etc., all of which may be subject to different rates.

In order to establish a plant ledger, specific items and units of property must be enumerated and classified by kind, group or de-

COST AND MANAGEMENT

partment, and their original cost obtained; as well as the accumulated depreciation and the remaining useful life.

It is not an easy matter to obtain the plant values, particularly if the accounting records show Real Estate.

Buildings, Machinery and Equipment and Goodwill all in one account.

If the books do not give you sufficient information to obtain detailed plant values, it is advisable to have a complete appraisal of all assets made by an Appraisal Company. With this information in the appraisal, you can proceed and install a Plant Ledger. The appraisal generally shows the following values:—

(a) Replacement Value New.

(b) Present Value or Net Depreciated Value.

- (a) Replacement Value constitutes the cost of replacing the asset new, based on to-day's costs.
- (b) Present Value or Net Depreciated Value constitutes the present day value, allowing for the depreciation that has taken place on the asset.
- (c) Insurable Values.
- (d) Uninsurable Values.

(5) Object and Uses of Plant Ledger

The object and uses of a Plant Ledger may be summarized as follows:—

- (a) To arrive at a reasonable charge for depreciation on Property and Plant in each department, enabling you to charge the depreciation to the manufacturing costs covering the product produced, and which utilized the equipment in the process of manufacture.
- (b) To provide up-to-date Insurance Values.
- (c) Show the total cost of property and equipment.
- (d) Constitutes a permanent up-to-date record of property and equipment.
- (e) Shows exact location of equipment in plant.
- (f) Shows the amount of depreciation accumulated on each asset.
- (g) Shows net depreciated values up-to-date.
- (h) The total amount of depreciation written off and balance in reserve account.
- (i) The estimated scrap value of plant.
- (j) The composite rate of depreciation of all plant.

The Plant Ledger aims to do for plant and equipment what the perpetual inventory record does for stock on hand.

(6) Description of Plant Ledger Record

The Plant Ledger can be compiled on card or loose-leaf form.

A loose-leaf book is most suitable, because it is unnecessary to carry in it more pages than are needed for current work, and additions can be made when required. Form No. 1 is a sample form of the Plant Ledger. An Explanation of the data on the form is as follows:—

INSTALLATION AND CONTROL OF MODERN PLANT LEDGER

Account No. The account number bears the same number as the equipment number, with the exception that it is prefixed in the Plant Ledger with the building number.

Sheet No. As the ledger increases in size, sheets are transferred out of the current ledger to a transfer ledger, thereby necessitating the numbering of the sheets.

Nature and description of Asset.

Under this heading, information should be shown as follows:—

Description (full description of asset) Plant No.
Used as (State what the equipment is used for).

Capacity—

Location in Plant Building No.
Purchased from Date Purchased
Manufactured by Maker's No.
Weight (Show when possible).

Cost of Assets

Under this heading the following information should be shown:—

Appraisal Depreciated Valuation	Amount
Net Purchase Price	"
Duty	"
Freight and Installation	"
TOTAL	"
Insurable Value	"
Uninsurable Value	"
TOTAL	"

Depreciation Data

Under this heading the following information should be shown:—

Scrap Value—(Estimated Value as scrap).

Wearing Value—(The value of the equipment after deducting the scrap value from the appraisal value or cost value.

Estimated Life—(A fair estimate of the useful life of the asset under the conditions of use).

Remaining Life—(This is for use when using appraisal values. For instance, the Appraisal Company shows that a steam engine has depreciated 25%, which means that 25% of the useful life has been used up. Assuming that 16 years is the useful life, it follows that 12 years would be the remaining life.

Depreciation Rate—The rate of depreciation is arrived at by dividing the remaining life into 100%. For instance, in the above case, the remaining life of 12% would constitute a rate of 8½%. This applies when using appraisal values. Of course, if the equipment were new, the rate would be 6¼%.

Depreciation per Annum—(Show in Dollars).

Depreciation per Month—(Show in Dollars).

Charge to: Under this heading you show the expense account charged with the depreciation.

Depreciation charges are applied to departments, upon the basis of the total valuation of the equipment in each, and upon the basis

COST AND MANAGEMENT

of floor space occupied by each department, when there are several departments on the floor.

If your Cost System is for a continuous process, you will find it best to charge depreciation to the departments, irrespective of the quantities produced.

Depreciation may also be charged on the basis of units produced by the factory. The extent to which depreciation can be allocated to departments, depends upon the extent to which equipment is itemized in the plant ledger.

Financial Headings: These headings require no comment, being the same as any other ledger.

Statistical Total Cost: The original cost of the asset is entered in the ledger, and this same amount is extended under the heading "Total Cost." The opening entries in the Plant Ledger are obtained from the General Ledger or the appraisal.

Monthly Depreciation: Each month the depreciation charge is credited in the ledger, and this amount is shown under this heading, in red ink.

Repairs and Renewals: If there should be any repairs and renewals charged to the asset, the amount is shown under this heading, in black ink.

Bal. in Depreciation Reserve: Under this heading the accumulated depreciation is shown, and thereby you are able to know immediately, the amount of depreciation reserved against the asset.

Of course, there may be debits to the account as well, and the balance in the reserve column would represent the net balance in the reserve account to apply against the asset, in case you are scrapping same.

(7) Identification of Equipment

Plant numbers are appointed for all the equipment, these numbers being either painted on the machine, or a small plate bearing the number, affixed to the machine, which ever is found most suitable. Each building is also numbered. The numbering of the plant provides identification, facilitates reference and treatment in the records. The plant number is the same as the account number in the Plant Ledger, as stated previously.

(8) Control of Plant Ledger With General Books

The values in the Plant Ledger should be controlled by the General Books. If the values in the General Books show a lump sum figure for Real Estate, Property, Machinery and Equipment and Goodwill, it is necessary to make a reconciliation of the Plant Ledger Values, as compared with the General Ledger Property Account. For example, the General Ledger Account shows an amount of \$1,000,000.00 and the appraisal values are \$600,000.00, it is apparent that the Goodwill item is \$400,000.00. Therefore, upon opening up your Plant Ledger it will be \$400,000.00 less than the control account, but from that date onwards, this difference will always remain the same. From that date, property additions are charged to the Control Account and entered in the Plant Ledger.

INSTALLATION AND CONTROL OF MODERN PLANT LEDGER

At the end of each month or accounting period, the Plant Ledger must be balanced with the Property Account and Depreciation Reserve Account in the General Books.

Summary control sheets are made in the Plant Ledger, showing total values of plant, total additions and removals, total amount of depreciation and total balance in Depreciation Reserve Account, etc.

If there should be more than one ledger, a control sheet is made for each ledger and a Master Control Sheet, for all ledgers.

(9) Methods of Determining Depreciation

One method of handling depreciation, which is condemned, although extensively used, is to wait until the end of the year, and then if the profit and loss statement shows that a good profit has been made, to charge a part of this profit to depreciation. If on the other hand, the profit and loss statement shows little or no profit, nothing is charged to depreciation. It is difficult to understand how any practical man can take the view that his plant and equipment have not worn out, because he has not made a profit.

Accountants and engineers have suggested numerous methods of charging depreciation; sinking fund, declining balance, fractional method, weighted years, fixed percentage, or straight line method, etc. The straight line method is the one most commonly used. To illustrate the fixed percentage or straight line method of depreciation:—

A machine cost \$120.00.

The estimated salvage or scrap value at the end of the useful life is \$20.00.

It has an expected life of 20 years.

Deducting the salvage value from cost, we obtain a wearing value of \$100.00.

This divided by the expected years of usefulness gives an annual depreciation of \$10.00.

Expressed in terms of formulae:—

Annual Depreciation =

$$\frac{\text{Cost New Less Scrap Value}}{\text{Useful Life}}$$

(10) Monthly Depreciation Voucher

A summary is made up from the Plant Ledger, arriving at the total depreciation chargeable to the different expense accounts. This summary becomes practically a standing Journal Voucher.

If there should be any changes in the plant ledgers, the control sheet shows the items, and the accounts affected are changed on the monthly Journal Voucher or standing Yearly Voucher.

The Monthly Voucher is as follows:—

Account	Amount	
	Dr.	Cr.
A	\$100.00	
B	50.00	
C	50.00	
D	50.00	

COST AND MANAGEMENT

To Reserve for Depreciation \$250.00

The Standing Voucher is as follows:—

	Account	Amt. Jan.	Amt. Feb.	Amt. Mar.	Etc.
Charge	A	\$100.00			
	B	50.00			
	C	50.00			
	D	50.00			

Credit Res. for Deprec. \$250.00

(11) Repairs and Renewals

There should be a clear conception of the items that constitute repairs and maintenance, and the items that represent renewals. Thus the repairing of a broken window sash is maintenance and is chargeable to Current Repairs, whereas the laying of a new roof is a renewal, and is chargeable to the Accrued Depreciation Reserve.

The accounting treatment of repairs and of replacements, which arrest or lessen deterioration on account of wear and decay, should be given careful distribution.

The best policy is that repairs which neither appreciably prolong the life of the asset, nor add to its efficiency or productive capacity, should be charged to the Operating Expense of the year in which they occurred.

It is also good practice to charge to Current Expense, the cost of assets having useful lives of one year or less.

(12) Obsolescence

The importance of obsolescence as it affects the useful life of property, is not entirely appreciated. Before it wears out, property is generally replaced by something bigger and better. This affects the depreciation rates, and has to be taken into consideration by the engineer and the cost accountant when establishing rates.

P. D. Leake, in his book "Depreciation and Wasting Assets," states that "In selecting the proper basis for an annual charge to revenues for depreciation of industrial plant, the evidence is irresistible that expiration of time is the dominating factor..... It is astonishing how rarely the rate of destruction of value, due to actual use, overtakes the rate of destruction, due to constant and inevitable decay and liability to obsolescence."

The conditions pertaining to obsolescence are peculiar to each individual industry, and, therefore, it is necessary that you study the obsolescence that has taken place, and that is taking place presently in your industry, when determining the useful life and rate of depreciation for your property items.

(13) Depreciation Reserve

Depreciation should be accumulated in a Reserve Account, for when depreciation is written off directly against the assets, original cost is frequently lost track of, and depreciation is soon computed on a depreciation basis.

INSTALLATION AND CONTROL OF MODERN PLANT LEDGER

The depreciation reserve should be charged with major renewals affecting the life of the assets. The reserve is directly affected when property is exchanged, sold, replaced, scrapped or lost, and the necessary entries should be made to record these charges.

(14) Hypothetical History of an Asset

To illustrate the use of the Plant Ledger, it is supposed that a 50 Horse Power Motor is purchased from The Canadian General Electric Company, for use in the Machine Shop of an Industrial Plant. 24-651 is its plant number—24 being the number of the machine Shop building and 651 the number on a plate affixed to the motor. The manufacturer's number is 53751. Its useful life has been determined as ten years.

The cost of the motor is as follows:—

Invoice cost	\$1,500.00
Freight charges	75.00
Installation	225.00
<hr/>	
Total Cost Jan. 1, 1924	\$1,800.00
Estimated scrap value	50.00
<hr/>	
Leaving a wearing value of	\$1,750.00

Annual depreciation is \$175.00, arrived at by dividing the wearing value of \$1,750.00 by the useful life of 10 years.

The record of the motor is as follows:—

- 1924—Annual Depreciation of \$175.00, no additions, no renewals.
At the end of the year there will be \$175.00 in depreciation reserve and a net depreciated ledger balance of \$1,625.00.
- 1925—Annual Depreciation of \$175.00, no additions, no renewals.
At the end of the year there will be \$350.00 in the depreciation reserve and a net depreciated ledger balance of \$1,450.00.
- 1926—Annual depreciation of \$175.00, no additions, no renewals.
At the end of the year there will be \$525.00 in the depreciation reserve and a net depreciated ledger balance of \$1,275.00.
- 1927—Annual depreciation of \$175.00.
The motor was rewound on the 5th day of December, 1927, at a cost of \$200.00. This was charged to the Reserve Account. At the end of the year there will be \$325.00 in the Depreciation Reserve and a net depreciated ledger balance of \$1,300.00. The former ledger balance of \$1,275.00 was decreased by the annual depreciation of \$175.00, leaving a balance of \$1,100.00, to which was added the \$200.00 charge, thus making a balance of \$1,300.00.
- 1928—Annual Depreciation of \$208.33. This is arrived at by dividing the new net wearing value of \$1,250.00 by the remaining useful-life of six years. No addition, no renewal in 1928. At the end of the year there is \$708.33 in the depreciation reserve, and the net depreciated value is \$1,091.67.
- 1929—On Jan. 2nd, 1929, the motor is sold for \$1,000.00. The net depreciated balance is \$1,091.67, and the sale price is \$1,000.00, making a difference of \$91.67. It is preferable to charge this

PLANT LEDGER

COST OF ASSET

DETAILS	AMOUNT
Appraisal Depreciated Valuation	
Net Purchase Price	\$1,500.00
Duty	75.00
Freight and Installation	225.00
Total	1,800.00
Insurable Value	1,600.00
Uninsurable Value	200.00
Total	\$1,800.00

NATURE AND DESCRIPTION OF ASSET

Appraisal Depreciated Valuation	\$1,500.00	Description—One 50 Horse Power Electric Motor, Inductive Type, 1,200 R.P.M. With Starting Compensator, Push Button Stop, 60 Amp. Switch and Power Wiring.	Plant No. 651.
Net Purchase Price	75.00	Used as Motor.	
Duty	225.00	Capacity, 50 Horse Power.	
Freight and Installation	1,800.00	Location in Plant, Machine shop, Floor 1.	Building No. 24.
Total	1,500.00	Manufacturer, Canadian General Electric Company, Limited.	Date Purchased, Jan'y 1st, 1924.
Insurable Value	200.00	Manufactured by Canadian General Electric Company, Limited.	Maker's Number, No. 53761.
Uninsurable Value	1,300.00	Weight, 1,250 lbs.	
Total	\$1,800.00		

DEPRECIATION DATA

Scrap Value	\$ 50.00	Estimated Life.
Wearing Value.....	1,750.00	Remaining Life 6 years, December 5th, 1927.

Depreciation Rate	10%
Per Annum\$175.00
Per Month 14.58

STATISTICAL

	DETAILS OF REPAIRS AND RENEWALS AFFECTING DEPRECIATION	BAL. IN DEPRECIATION RESERVE	REPAIRS AND RENEWALS	MONTLY DEPRECIATION
1907				
1908				
1909				
1910				
1911				
1912				
1913				
1914				
1915				
1916				
1917				
1918				
1919				
1920				
1921				
1922				
1923				
1924				
1925				
1926				
1927				
1928				
1929				
1930				
TOTAL				

REFERENCE

[illegible]

COST AND MANAGEMENT

THE TREND OF PRODUCTION COSTS

difference of \$91.67 to Machine Shop Expense, and crediting the reserve for Depreciation Account. The Reserve Account will show a balance of \$800.00. The \$1,000.00 would be credited in the Cash Book to Property Account, and in the Plant Ledger record in the column "Total Cost," thus leaving a balance of \$800.00 in this column, which is offset by the credit balance of \$800.00 in the Reserve for depreciation Account.

It will therefore, be necessary to make an entry in the books as follows:—

Dr. Reserve for Depreciation	\$800.00	
Cr. Property a/c		\$800.00
1929—To close out of the above accounts, value of motor sold:		
Cost	\$1,800.00	
Sold for	1,000.00	
		\$ 800.00
Balance		\$ 800.00

The hypothetical history is given to show how the plant ledger operates, and by what manner of contingencies it is affected.

THE TREND OF PRODUCTION COSTS

AVERAGE commodity price levels, according to the Dominion Government index, were lower in May and June, but returned to the former level in midsummer. The change was due chiefly to fluctuations in grain and in flour and similar products. The index numbers, based on 502 commodities with 1926 as the base period, are as follows:

	July	June	July
All commodities	96.1	92.6	96.0
Consumers' goods	95.4	93.4	94.4
Producers' goods	96.8	93.3	100.1
Producers' equipment	92.4	94.1	94.9
Producers' materials	97.3	93.0	100.7
Bldg. and construction materials	97.9	98.6	99.1
Manufacturers' materials	97.0	91.8	101.1

In July there were nine labour disputes, six of which had been carried over from June, while three commenced. Six were terminated during the month, leaving only the following three: Plumbers at Kingston; shoe factory workers at Toronto; and moulders at Lachine.

High rates for loans of all kinds are still the feature of production costs, and they are having a restrictive effect.

COST AND MANAGEMENT

NEW "CENTRAL ONTARIO" CHAPTER IS FORMED

AT a meeting held in Kitchener, Ont., on Tuesday, Sept., 10 attended by about twenty-five men interested in cost work, it was decided to organize a "Central Ontario" Chapter of the Society.

Those present at the meeting included: Mr. Smith, of Baetz Bros. Furniture Co., Ltd., Kitchener; Carl Heimrich, of Cluett, Peabody & Co., of Canada, Ltd., Kitchener; A. B. Musselman, of Dominion Button Manufacturers, Ltd., Kitchener; A. E. Bock, of The Philip Gies Foundry, Kitchener; J. G. Brown, C.A., of Thorne, Mulholland, Howson & McPherson, Kitchener; E. Tailby, L. A., Kitchener; H. F. Wilson, of Wilson & Fessenden, Kitchener; V. Buchanan, of Woelfle Shoe Co., Ltd., Kitchener; S. H. Niece, Kitchener; A. H. Schlegel, of Canadian Office & School Furniture Co., Ltd., Preston; E. J. Miller, of Globe Furniture Co., Ltd., Waterloo; C. T. Black and Mr. Taylor, of Canadian General Rubber Co., Ltd., Galt; E. R. Scott and C. R. Dörschell, of Goldie & McCulloch Co., Ltd., Galt; R. Scroggins and R. Hedley, of Scroggins Shoe Co., Ltd., Galt; J. J. Kidd, C.A., of Thorne, Mulholland Howson & McPherson, Galt.

T. S. Jardine and J. E. Carruthers of Toronto, directors of the Society, R. E. Love, of Hamilton, an ex-chairman of Hamilton Chapter and a director of the Society for some years, and W. A. McKague, executive secretary of the Society, were present.

The meeting was arranged by the Society, through the co-operation of its members in the Kitchener-Galt section, and of others interested in the Society's work.

At the opening of the meeting E. Tailby L.A., was requested to take the Chair. After a few opening remarks, he called on Messrs. Carruthers, Love and Jardine, respectively, to say something about the work of the Society as a whole, and the plans followed in other cities. Mr. McKague reported on the local situation, and stated that he was satisfied that the local chapter would be active and successful, with a membership of probably forty. A large number who were unable to come to the organization meeting because of the short notice or other engagement, had expressed their interest.

After a general discussion it was moved and seconded and carried unanimously that a Chapter of the Canadian Society of Cost Accountants to be known as Central Ontario Chapter, be organized.

It was then moved, seconded and carried unanimously, that Messrs. Tailby, Wilson and McKague be a committee empowered to appoint provisional directors for the Chapter. This committee after a brief interval reported the appointment of the following:—

C. T. Black and E. R. Scott of Galt; A. H. Schlegel, of Preston; E. J. Miller, of Waterloo; Carl Heimrich and E. Tailby, of Kitchener.

The new Chapter will be for members of the Society in Kitchener, Waterloo, Preston, New Hamburg, Elmira, Hespeler, Galt, Guelph, Stratford and other convenient points. The provisional directors will function until the first regular meeting of the Society when directors for the 1929-30 season will be elected. The provisional directors plan to hold the first regular meeting on October 10, and hope to secure a speaker of prominence for the occasion.

The directors of the Chapter will consider the desirability of holding the regular meetings at different points in the territory.

